CASES IN SURGERY,

WITH OBSERVATIONS.

BY

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EDINBURGH:
SUTHERLAND & KNOX, GEORGE STREET.

MDCCCXLIX.

[FROM THE MONTHLY JOURNAL OF MEDICAL SCIENCE, MAY 1849.]

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CASES IN SURGERY.

Case I.—*Severe Injury of the Right Upper Extremity by Machinery; Amputation of the Shoulder Joint; Recovery.*

On the morning of the 9th Dec. 1847, James Watt, millwright at a large paper mill in the vicinity of Edinburgh, when inspecting the machinery, perceived that a part of it was loose. While engaged in fastening the loose part, the sleeve of his jacket was caught, and the right arm dragged between two wheels, and rapidly crushed. Notwithstanding the fearful nature of the accident, he possessed sufficient presence of mind, on feeling himself drawn forwards, to take off his cap with his left hand, and place it in a position to check in some measure the revolution of the wheels, and at the same time he directed those about him to cut the sleeve of his coat, telling them that the arm was already torn through. He was extricated just in time to prevent the body being drawn in, but not before the soft parts on the right side of the chest had suffered severely. The accident happened about half-past four A.M., and I saw him at half-past seven A.M.

I found Mr Falconer and Dr Thomson in attendance. The patient was lying in bed, pale and exhausted, having lost a considerable quantity of blood; but though suffering great agony, he was quite sensible; the fragments of his clothes which had been left by the machinery had been removed, some stimuli had been administered, and external warmth applied; his pulse was about 120, and the skin was covered with cold sweat. The injured arm presented a frightful appearance; the limb was completely detached from about three inches above the elbow, and the humerus was again broken through obliquely immediately below the insertion of the deltoid, leaving the attachment of that muscle entire; but on the inner side, the fracture had splintered the bone up to within an inch of the joint; the middle part of the humerus, together with the soft parts, were hanging in shreds. On the right side of the chest, the integuments had been entirely removed to within two inches of the sternum; the clavicular and sternal portions of the pectoralis major had been completely torn off, so as to expose the pectoralis minor, the intercostal spaces, and externally the fascia covering the axillary vessels and nerves. The fragment of the humerus was drawn upwards and outwards by the deltoid, and the lower fibres of the great pectoral which were entire, were tightly stretched across the lower border of the large wound, and gave it the appearance of a deep dissection. Although from the nature of the injury, and the state of the patient, I had almost no hopes of his recovery, I thought it right to give him the only chance, viz. by amputation at the shoulder joint.

A small quantity of spirits and water having been given, chloroform was then administered. About a drachm was poured upon some lint and applied to his nostrils by Dr Thomson. He inhaled it readily, and scarcely a minute had elapsed ere it took effect: the fibres of the exposed muscles were first seen in violent action, and the face became suffused, the breathing became stertorous, the fibres of the muscles assumed a slight tremulous motion, and then became perfectly still; his pulse fell in frequency, but was firm; the full effect of the chloroform was obtained in three minutes.

Mr Falconer compressing the axillary artery between his fingers, above the lesser pectoral, I proceeded to amputate by forming my flap from the outer and back part of the shoulder, where the integument and muscles appeared sound, saving as much skin as possible. From the short lever remaining, I had anticipated considerable difficulty in disarticulating the head of the humerus; but in this I was agreeably disappointed, for, owing to the complete relaxation of the muscles induced by the chloroform, I was enabled to disarticulate it rapidly and with the most perfect ease. The insertion of the lower fibres of the great pectoral, and the other soft parts on the inner side of the humerus were divided, and the fragment of the limb removed. The posterior circumflex and two other vessels were tied, and next the axillary at the point where my incision had divided it: perceiving, however, that this point was close to the origin of some large branches, and fearing, moreover, lest it might have suffered from the injury, I laid bare the vessel higher up, beneath the lower margin of the pectoralis minor, and tied it there also; after removing carefully all doubtful-looking portions of muscle and skin, the flap was brought forward and found to cover the wound much better than I expected; it was secured by several points of suture, supported by compresses placed posteriorly at the lower part to prevent dragging, some warm water dressing was placed over the surface anteriorly, and the whole secured by a split cloth bandage.

During the whole of the proceedings, which occupied about a quarter of an hour, the patient remained perfectly tranquil, and only became conscious after the dressing had been completed; a little wine and water were then given. He stated that he had felt no pain, and indeed knew nothing of the operation, but now felt much easier and revived; his pulse was at this time 68, and pretty firm: I left him in charge of Mr Falconer, desiring that he should have an opiate draught. According to Mr Falconer's report, the pulse gradually rose, and at three P.M. was 84 in the minute; there was considerable thirst, and he complained of darting pain in the wound, also of slight nausea, which, however, soon left him. In the evening he was less thirsty; the pulse continued the same, and he passed about six ounces of urine. Had a draught of thirty drops of solution of morphia at midnight.

At four A.M. on the 10th, his pulse was slightly accelerated and harder; he had slumbered occasionally for about half an hour at a time, but woke with pain in the wound; the skin was warm and moist, and after he had passed about six ounces of high coloured urine, he fell asleep, and rested for some time; at noon he had a laxative draught.

On the morning of the 11th he continued pretty easy, having passed a good night, but as his medicine had not acted, he got a dose of castor-oil. His tongue was white and furred. Before twelve o'clock his bowels had acted twice freely, and his skin was moist, and of a natural heat; he was allowed a little weak beef-tea. In the afternoon his pulse had risen to 100 in the minute, and was pretty full, though soft. The beef-tea was discontinued, and a little thin arrow-root allowed instead. In the evening he had passed water freely, and felt easy, but his pulse was still about 100, and the skin hot; had no headache. To have a draught of morphia and ipecacuan wine at bed-time.

12th.—7 A.M. Has passed a good night, pulse diminished in frequency and soft, and skin of a moderate heat.—3 P.M. Has suffered from sickness since morning. The wound was now dressed for the first time, and at his own request chloroform was administered; but after it began to affect him, vomiting took place, and Mr Falconer desisted from its use. The wound was found of a favourable appearance; suppuration had commenced at the lower part; a little wine was administered previous to the dressing; he felt much easier after its completion, when an opiate draught was given.

At 10 P.M. his pulse was 92, and soft; he still felt sick, and had not slept since the dressing. To have a large opiate draught.

13th, Monday.—Passed a bad night; suffered greatly from sickness and vomiting; pulse 96, tongue covered with white fur, but red at tip and edges; half a grain of solid opium was given him. At noon the bilious vomiting and sickness still continued; pulse 100, countenance anxious. To have one grain of solid opium. At six P.M. he was much easier, the vomiting had ceased; he had taken a little thin arrow-root and drank some tea. As he had no evacuation from the bowels since Saturday, an enema was ordered, and after it had acted a grain of opium was given at 10 P.M.

On the 14th I saw him along with Mr Falconer, and dressed the wound, which I found uniting at the upper part, and granulating at the other parts of the wound, the suppuration was of a healthy character; he bore the dressing without much fatigue; his pulse previous to the dressing was 86 and soft, the expression of his face and general appearance good. He had had no return of the nausea or vomiting, but his tongue was still somewhat furred, and he complained of thirst. For the purpose of allaying thirst and abating the irritability of the stomach, I sent him some citrated alkali for effervescing draughts.

On the 17th, one of the ligatures came away, and on the 18th another, but without the slightest tendency to bleeding: from this time he continued to go on favourably; the wound healed rapidly, and no circumstance worthy of note took place, except a slight attack of bronchitis, which was promptly and actively treated, and he was able to leave his bed on the 1st of January 1848 for a short time, at which period a great part of the wound had cicatrized. On the 8th of January, the ligature from the upper part of the axillary artery separated (this ligature had been marked at the time of the operation by a double knot on its free extremity; the ligature from the lower part of the vessel, where it had been divided in the amputation, came away on the 17th of December).

In the beginning of February the wound was completely healed, with the exception of one part about the circumference of a sixpence, where a ligature projected, this I took away some time afterwards, and then this remaining part also healed up rapidly.

Remarks.—This case affords an example of the great amount of injury from which the system may recover; and the results of this and similar cases warrant us in entertaining hope and having recourse to operative measures even in the most aggravated cases. Few examples of injury could have presented a more frightful appearance, or less likelihood of a favourable result, not so much from the shattered state of the arm and the quantity of blood he had lost, as on account of the extent of the laceration of the soft parts covering the chest, one side of the chest being almost denuded of its cutaneous and muscular coverings, and the patient lying cold, pallid, and collapsed, from the effects of the severe suffering he had undergone.

From the state in which I found him, I have little doubt that, had he been removed even a short distance to obtain surgical aid, the result would probably have been very different. Indeed, from what I have seen of primary amputations, I believe that the very different results of such amputations in civil hospitals and military practice, and the comparatively greater success which will be found in private practice over hospital cases, is owing, in a great measure to the fact, that in military and private civil practice, the operation is performed either on the spot, or at a short distance only from where the accident occurred, so that the patient undergoes but one shock; whereas a majority of the cases presented to the surgeon in hospital practice, are often brought from a considerable distance, not in the easiest or most eligible conveyances,—and thus the patient just recovering from the first effects of severe injury, is subjected to a second shock, or rather series of shocks, from the jolting of the shattered limb, before undergoing amputation; a condition which, in itself, apart from other considerations as regards the effects of hospital air, &c., is evidently less favourable than that of the patient to whom surgical assistance has been afforded without his having undergone a rough and exhausting journey.

There is another point to which I would direct attention, as I consider it of some importance to the prevention of secondary hemorrhage, in cases where there is extensive injury of the soft parts around the vessels. In severe accidents from direct violence by machinery, the parts even beyond the apparent injury often suffer indirectly, their vitality is impaired above the points of amputation, and extensive suppuration or separation of small sloughs takes place around the vessels, or the vitality of the arterial tissue itself may have been so impaired by the traction and twisting, that separation of the ligature will probably take place at a period before the canal of the artery has been obliterated, and secondary hemorrhage occur. It was to avoid such a risk in this case, that besides tying the axillary at the point, divided by the knife in amputating, I laid it bare and tied it higher up; and the result, I think, shows the propriety of the practice, for the lower ligature came away in eight days, so that, except for the ligature higher up, secondary bleeding would likely have occurred at that time.

In a case somewhat similar (reported in the *Lancet*, June 1848), but from the description, apparently attended with less injury of the soft parts of the chest, Mr Fergusson tied the axillary artery carefully at the point, divided in amputating. The patient went on favourably till the 9th day, when secondary hemorrhage took place from the axillary, Mr F. then tied the artery above the spot where it had given way; at five o'clock the next morning another bleeding occurred, and the house surgeon again tied the vessel half an inch higher up; at one P.M. hemorrhage again suddenly took place. Mr Simon cut down, and secured the subclavian quickly and skilfully; but the patient never rallied, and died a few minutes after the subclavian was secured. In Mr Fergusson's case there was not, apparently, any cause on account of the condition of the soft parts, for securing the artery otherwise than in the ordinary manner; for no one would advocate cutting down and tying the subclavian or axillary in every case of primary amputation at the shoulder for injury of the arm; but when secondary hemorrhage did occur, would the patient not have had a better chance, if, besides tying the axillary immediately above the point where it had given way, the subclavian had been also secured at that time, so as to diminish the impulse of the blood upon the weaker point of the vessel? In the Number of this Journal for February 1848, I have given the history of a successful case in which I tied the lower portion of the axillary for bleeding from the brachial artery at the bend of the arm, following a severe burn, besides tying the vessel above and below the bleeding point; and I have there stated the principle on which I acted; the results of that case, and a late careful and more extended repetition of my former experiments on the general effects of the ligature of arteries, have also served to confirm me in the correctness of the particular principle alluded to, viz., that when we require to tie an artery, at a point where the vitality of its coats, or of the surrounding textures is much impaired, it is better at the same time to apply a ligature higher up where the vessel is healthy, so as to diminish the impulse upon the less healthy part of the vessel where the lower ligature is applied to obviate the risk of secondary hemorrhage, should that ligature separate too early, as is likely to happen.

CASE II.—*Disarticulation of the Sternal Half of the Clavicle.*

G. L., labourer, forty-eight years of age, and of strumous habit, had suffered for a length of time from epileptic fits, consequent upon an injury of the head, received eleven years ago, by a fall from a height. He stated that the clavicle had not been broken or injured at that time. In the beginning of December 1847, he was seen by Mr Falconer, Loanhead, on account of an abscess which had formed towards the outer part of the clavicle. This abscess was opened, and although the matter discharged was thin and unhealthy, no diseased bone could be detected by the probe. The wound healed in about a fortnight or three weeks. Shortly after it had cicatrized, the patient fell down in one of his epileptic fits, and on recovering he found a thick but sharp-pointed portion of the clavicle projecting through the thin recent cicatrix. Mr Falconer states, that the projecting portion of bone was of diseased appearance when it first protruded; and when I saw it, about a week afterwards, in the beginning of January 1848, the exposed portion was rough and apparently necrosed. After this, although the parts were kept in perfect rest, abscesses formed at various points near the clavicle, about the root of the neck, and in the supra-clavicular space, in the vicinity of the subclavian vessels; also above the sternum. Near the sternum there was a small opening, through which the bone could be felt rough and bare; and the other abscesses, although the probe could not detect any direct communication with the diseased bone, evidently depended upon the irritation excited by its presence. I saw the patient two or three times after this, but the exposed portion of bone did not become loose; and it resisted every effort to detach and remove it.

After waiting for nearly three months in expectation of the necrosed portions becoming loosened by the natural process, and finding it still impossible to detach and extract it from the rest of the bone, whilst the man's health was rapidly sinking under the constant discharge and hectic, I proposed the removal of the whole internal half of the clavicle from its sternal articulation, so as to include all the diseased bone, to which proposal the patient at once assented.

On the 11th April 1848, I proceeded to excise the diseased portion of the clavicle, assisted by Messrs Goodsir and Falconer, and in the presence of Dr Smith, Messrs Harvey and Edwards. Chloroform having been given, I made an incision about three and a half inches along the inner half of the clavicle, commencing about four lines internal to the sterno-clavicular articulation, and then made a perpendicular incision about an inch and a half in length across the former, at the point corresponding to the sterno-clavicular articulation. The clavicular attachments of the sterno-mastoid and pectoralis muscles were next divided. In doing this there was pretty smart hemorrhage from numerous small vessels. I now divided the clavicle a little external to the exposed diseased portion, and tried to raise the divided extremity so as to pull it forwards from the great vessels. I found, however, that I could not effect this, owing apparently to some muscular attachments, which had not been completely divided ; these I divided fully, when I could see the bone thickened and irregular, owing to the deposition of new bone. I then dissected around this cautiously; and Mr Goodsir attempted to draw the bone forwards, by means of a pair of strong tooth forceps, which I had brought on purpose, in case of difficulty. The dense and firm structures, however, prevented it being raised, so that I had to dissect the extremity of the bone cautiously, as the condensation extended as far inwards as the position of the great vessels. Whenever the mass of condensed tissues was wholly divided, the bone was raised and drawn outwards and forwards from the chest; then, by keeping the edge of the bistoury directed obliquely towards the clavicle, I divided the rhomboid or costo-clavicular ligament, and the other remaining attachments, and by using the free portion of the clavicle as a lever, I was enabled to disarticulate it readily from the sternum. Although there had been smart bleeding during the performance of the operation, only three small vessels required ligature. The consolidation of the parts, and the diseased state of the skin, prevented the greater part of the edges of the wound being united by suture, and in the site of the removed bone there remained a very ugly looking fossa, in which the pulsation of the great arteries could be seen and felt. This cavity was filled slightly with charpie, and supported by a bandage. After the patient was placed in bed, and had recovered from the effects of the chloroform, an opiate draught was exhibited.

I saw him again on the 15th of April, when he was suffering from an attack of bronchitis, to which he had been long subject. He had a constant harassing cough, but was expectorating freely. The impulse of the coughing was communicated strongly to the wound, which was suppurating freely, and healthy granulations were beginning to spring up. With the exception of the cough, he was going on favourably. Warm water dressing was applied to the wound, and he was allowed nourishing diet.

As the accounts I received from Mr Falconer continued favourable, I did not visit him again till the 24th of April ; the cough had then almost entirely left him, and he was sitting up with the arm in a sling ; the wound was covered with granulations, and contracting rapidly. For a few days previous to my visit, the red lotion had been applied to the wound. From this time I did not see him again till the 7th of May, when the wound had completely cicatrized. Little treatment beyond the occasional application of escharotics to the exuberant granulations had been required ; his general health and appearance had much improved, and he now slept well at night, and was free from pain.

I saw him again in September ; there was very little falling in of the shoulder of the side from which the clavicle had been removed. His general health continued good, and he had for some months been at his usual employment of a labourer.

Remarks.—The removal of the external half of the clavicle in this case was, I consider, sufficiently warranted by the state of the patient, the constitutional irritation he was suffering, and the repeated formation of ill-conditioned abscesses at the root of the neck, and in dangerous proximity to the large vessels. Under these circumstances there was distinct indication for operative interference, either by removing the diseased portions of the clavicle, or by removing the whole sternal half of the bone at the articulation. I preferred the latter operation for the following reasons :—The dead portion which presented itself was not loose or detached, and the probe introduced through the sinuses detected other dead portions nearer the sternum ; so that the full extent of the disease could not be accurately ascertained; and as the state of the patient's general health forbade waiting for nature to throw off the dead portions, it appeared to me that the operation necessary for the removal of such diseased portions would be equally severe, and the effect less certain, than removing the internal half of the bone *in toto* at the articulation. Moreover, such operative interference might have been followed by disease of the new substituted bone, whilst removal of the internal half of the clavicle would remove the whole disease; and as the continuity between it and the acromial end was already broken, union being maintained only by ligamentous tissue, the inner half was really of no use to the patient.

The difficulties which in this case rendered the operation more protracted than I expected from numerous trials on the dead body, were owing principally to the previous disease having caused great alteration in the parts around the bone; these were condensed, and their appearance, relations, and attachments altered close to the position of the subclavian vessels. The firmness of the new attachments prevented the clavicle being drawn forwards from these vessels, and rendered a cautious dissection necessary to free that portion of the bone, the altered and irregular form of which, from the deposition of new osseous matter, was also a cause of difficulty, as it prevented me keeping the edge of the bistoury close to its posterior surface. I conceive that stage of the operation the most dangerous; but when the posterior surface of the bone is smooth, or when, after separating the muscular attachments and dividing the clavicle with the saw, that bone can readily be drawn forwards, and the edge of the knife kept close to the part to be removed, I should think the operation would be both more readily accomplished, and with much less risk.

As to the disarticulation at the sternum, that is effected without much difficulty, for when the incision of the integuments over the joint is free, and the rhomboid ligament attaching the clavicle to the rib wholly divided, the articulation is easily opened from above and anteriorly, and then, by using the bone as a lever, it can be twisted so as to divide the posterior part of the capsule, with scarcely any risk to the pleura or great veins; besides, the strong layer of the deep fascia, the origin of the sterno-hyoid and thyroid muscles, and generally a layer of fat, lie between the knife and these important parts; so that, if ordinary care be taken, they can scarcely be injured; and, if further security were required, the use of a probe-pointed bistoury, to divide the posterior part of the capsule, would, I conceive, preclude any chance of accident in this part of the operation.

CASE III.—*Amputation at the Ankle Joint.*

Jane P——, aged ten, of strumous constitution, had suffered from abscesses over the heel and inner ankle, which commenced about two years ago. I saw her for the first time in July 1847, when visiting another case at Coldstream. As her health then had not suffered much, I advised the use of a stimulating astringent lotion to the ulcer, and the employment of cod-liver oil internally. Under this treatment she seemed to go on favourably for a time, but towards the end of June 1848, the foot became worse; fresh collections of matter formed; and there was constant pain, increased at night, preventing sleep. When I saw her again in August last, her general health had begun to suffer ; there was then a considerable elastic swelling over the heel and inner ankle, and an ulcer about the size of a shilling was situated between the inner malleolus and heel. The integuments for some distance around the ulcer were of a dark purple colour, and the subcutaneous tissue was condensed, and swollen with sinuses passing towards the joint. The edges of the ulcer were ragged and irritable; the centre was occupied by a yellowish slough. Amputation was evidently indicated, but the appearance of the soft parts, and the position of the ulcer corresponding to the posterior tibial vessels, rendered it questionable how far it was right to amputate at the ankle joint. Desirous to give her the advantage if possible of amputation at the ankle, I had her brought to town, that I might carefully watch the case.

She came to Edinburgh on the 16th August, and having examined the foot several times, I determined to amputate at the ankle, which I did on the 18th. I employed a modification of Mr Syme's plan of operation, suggested to me by my friend Mr Goodsir. This modification consists in first disarticulating, and then carrying the knife downwards behind the os calcis, so as to form the plantar flap from the heel from above downwards, instead of raising and dissecting that flap upwards. Chloroform having been given, I commenced in the usual manner, with an incision across the anterior aspect of the joint, from the external to the internal malleolus. The knife was then carried deeply across the plantar aspect of the heel, round from the internal to the external malleolus, where the incisions commenced. The form of the flap being thus marked out, I disarticulated by dividing first the external lateral ligament, and then carrying my knife close to the bone I divided the internal lateral ligament, and separated the soft parts on the inner side of the foot, which was now turned forwards. The tendo Achillis was then divided, and by carrying the knife close round the back part and sides of the os calcis, that bone was readily turned out from the plantar flap. The malleoli were removed by the saw, and the operation completed in the usual manner. Two arteries only required to be secured, one towards the outer side of the plantar flap, and the anterior tibial artery. After closing the wound by interrupted suture, I dressed the stump with two long and broad strips of lint, arranged in a crucial manner, and secured by a circular slip, so as to support and press the flap against the surface of the bones, and the patient was put to bed. [This method I have used in several cases of amputation, and found it quite as effectual in supporting the flaps as compresses and bandages. It is more simple, and by keeping the lint slightly moist with tepid water, it can be easily removed in case of hemorrhage occurring. The subsequent treatment is thus facilitated, and much pain is saved to the patient.]

On examining the foot, the soft parts around the ankle joint were found thickened and infiltrated, and the sinuses from the small ulcers opened into the joint. The articular cartilages covering the lower end of the tibia, and corresponding surface of the astragalus, were affected with the brown degeneration, and extensively ulcerated. The bones were denuded, and carious at several points. A section of the os calcis, shewed its external fibrous plate reduced to a very thin shell. The interior was occupied by the soft greasy degeneration common in scrofulous bones, and contained a small portion of dead cancellated texture lying loose in the centre.

It is unnecessary to give the daily history of the case, as every thing went on favourably ; the incisions healed rapidly ; the treatment required was principally for the old ulceration of the soft parts, which continued very intractable; it healed well for a day or two at first, and then again became sluggish ; under the use of nitrate of silver, however, it began to improve more steadily.

On the 4th of September, the incisions having been healed for some time, a small abscess formed at the outer part of the heel, which was opened; and some boils began to appear on different parts of the body. Under these circumstances, as nothing remained but the ulceration of the skin, and as she was now able to sit up and had been out, I thought it advisable to send her home to the country. By a letter which I received from Dr M. Turnbull, dated the 22d January 1849, it appears that for a long time there was little appearance of the ulcer healing until about the end of December, when Dr T. had applied a lotion of sulphate of copper, under which it improved rapidly, and at the date of Dr T.'s letter the ulcer was nearly well, and her general health was good. Since that time I have heard that she is well and going about.

Remarks.—The plan of operation adopted in this case, seems to have the advantage of being performed more rapidly and with less twisting and manipulation of the plantar flap, than when we dissect that flap from below upwards, as in the ordinary method. The form, position, and connexions of the flap, are the same in both methods. In other words, it seems a simpler and more easy method of producing the same result.

The great advantages of the method advocated by Mr Syme, for amputation at the ankle, over all others hitherto proposed, consist, I think, 1st, in forming the flap from the elastic, fatty, and cutaneous tissues of the heel, parts adapted by nature to sustain pressure; and, 2d, from the lateral connexions of the flap preserving the vessels on both the internal and external sides of the ankle—thus insuring a sufficient vascular supply. Any rapidity or ease in operating, which sacrificed either of these advantages would be too dearly purchased, and most of the plans hitherto proposed, do so to some extent. Thus, for example, the plan of a large flap cut from the internal malleolar and plantar region, as proposed by M. Sédillot and others, besides sacrificing a portion of the plantar tissue, has, moreover, the great disadvantage of dividing the external lateral vascular connexions, and so, to a certain extent, endangering the vitality of the flap. For it is an anatomical fact, familiar to every one accustomed to dissect minute vascular preparations of the foot, and one which ought not to be lost sight of, that the plantar tissues of the heel which form the flap, receive at least quite as much of their arterial supply from the terminal ramifications of the external malleolar, and interosseal branches of the peroneal artery at the ankle, as from the posterior tibial above its division into the plantar arteries, and it is of importance to the vitality of the flap to preserve these sources of supply as well as that from the posterior tibial.

The plan of operation, or rather the modification of Mr Syme's plan used in the foregoing case, preserves all the advantages of his method, whilst I certainly found it more easy and rapid of execution than when I have operated in the usual manner by dissecting the flap from below upwards, before disarticulating.

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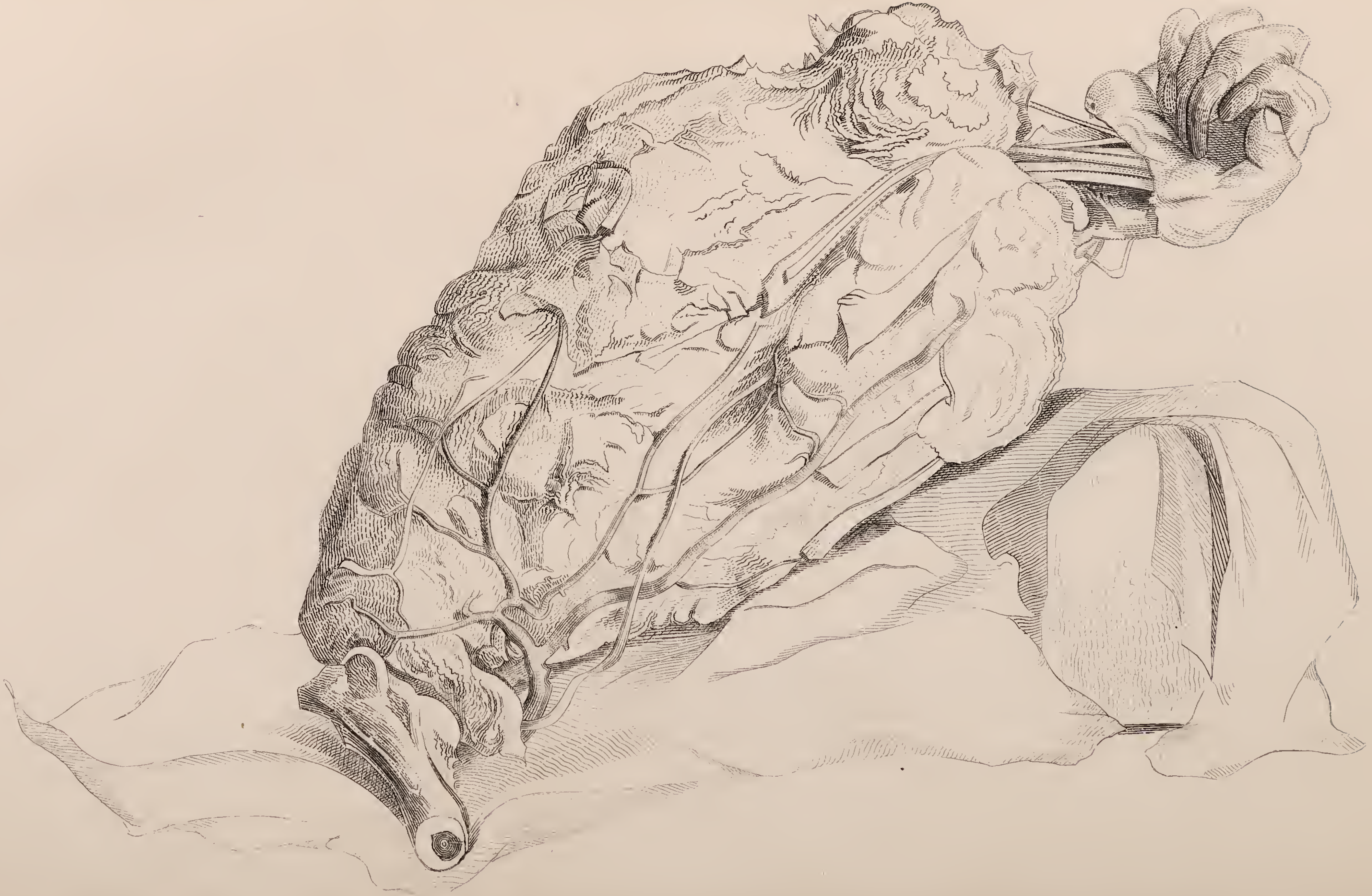

Mr Spence's case of Osteo Sarcoma.